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10/537,068	06/01/2005	Wim Van Houtum	NL021308	8817

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EXAMINER

TIMORY, KABIR A

ART UNIT	PAPER NUMBER
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2609

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/07/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/537,068

Applicant(s)

VAN HOUTUM, WIM

Examiner

Kabir A. Timory

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— The MAILING DATE of this communication appears on the cover sheet with the correspondence address —

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to, See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 6/1/2005, 5/30/2006.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 2, 3, 13, and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2, lines 1 and 3, claim 3, line 2, claim 13, lines 1 and 2, claim 14, lines 1 and 2, recite the limitation "**nonzero delay**". There is no clear definition for this limitation in the claims. It is unclear if this limitation of the claim intended to refer "phase shift value" or "amplitude shift value". However, the term "**nonzero delay**" differs from "phase and amplitude shift delays". However, the examiner suggests clarifying the term and elaborating on the definition of the term "**nonzero delay**".

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

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only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claim 1, 2, 4, 5, 9, and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Tehrani et al. (US Pub Number 2002/0164963).

(1) Regarding claim 1:

As shown in figure (1) Tehrani et al. discloses a data communication system comprising:

- a transmitter having first and second transmitting antennae (figure 1,120, 138, 140, column 0044, lines 10-12), the signal path of the first antenna exhibiting a different delay than the signal path of the second antenna (this limitation is inherent because in a multipath environment, the signal takes different paths from the source to get to destination and each of these signal experiences different delays as a result each antenna experience different delays) (column 005, lines 7-11); and
- a receiver having third and fourth receiving antennae (figure 1,110, 122, 124, column 0044, lines 10-12), the signal path of the third antenna exhibiting a different delay than the signal path of the fourth antenna (this limitation is inherent because in a multipath environment, the signal takes different paths from the source to get to destination and each of these signal experiences different delays as a result each antenna experience different delays) (column 005, lines 7-11).

(2) Regarding claim 2:

The data communication system of Claim 1, wherein:

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- a nonzero delay of one of the signal paths of the first and second antennae is different from a nonzero delay of one of the signal paths of the third and forth antennae (this limitation is inherent because in a multipath environment, the signal takes different paths from the source to get to destination and each of these signal experiences different delays as a result each antenna experience different delays) (column 005, lines 7-11)

(3) Regarding claim 4:

The data communication system of Claim 1, wherein:

- the transmitter further comprises a transceiver which is capable of both transmission and reception at different times by means of the first and second antennae (figure 1,120, 138, 140, column 0044, lines 10-12); and
- wherein the receiver further comprises a transceiver which is capable of both transmission and reception at different times by means of the third and fourth antennae (figure 1,110, 122, 124, column 0044, lines 10-12).

(4) Regarding claim 5:

The data communication system of Claim 1, wherein:

- the data further comprises voice data (column 0001, lines 1-2).

(5) Regarding claim 9:

The data communication system of claim1, wherein:

- the delays comprise RF delays (column 0005, lines 7-11).

(6) Regarding claim 11:

The data communication system of Claim 1, wherein:

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- the delays comprise baseband delays (this limitation is inherent to be a baseband unit transceiver that has a delay) (column 0338, lines 4-8).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tehrani et al. in view of Thompson et al. (IEE Proc.-Commun., Vol. 147, No.6, December 2000).

(1) Regarding claim 3:

Tehrani et al. further discloses a data communication system (paragraph 0001, lines 1-2).

Tehrani et al. discloses all of the subject matter as described above except for specifically teaching the value of one of the nonzero delay is twice the value of the other nonzero delay.

However Thompson et al. in the same field of endeavor, teaches teaching the value of one of the nonzero delay is twice the value of the other nonzero delay (column 3, lines 58-64).

One of ordinary skill in the art would have clearly recognized that when two diversity antennas are used in the system, the delay diversity method is applied to the transmitted signals. In this method the time delay of L code is applied to the signal of

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the second antenna to generate an artificial multipath signal for 2L. Also, using this method will provide 2L diversity. To reduce the effect of multipath interference, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the diversity technique, which is the use of two transceivers in designing wireless network. Also as taught by Thompson, using the delay diversity method would reduce the multipath effect in the system. The diversity technique ensures if one transceiver is in radio frequency (RF) null the other is not. Furthermore, it enhances the performance of the system in high interference areas such as multipath environment.

7. Claims 6, 7, 8, 10, 12, 13, 16, 17, 18, 19, 20, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tehrani et al. in view of Joo et al. (US Patent Number 2003/0095533).

(2) Regarding claim 6:

Tehrani et al. discloses a data communication system (column 0001, lines 1-2).

Tehrani et al. discloses all of the subject matter as described above except for specifically teaching digital data.

However Joo et al. in the same field of endeavor, teaches the process of digital signal to make communication over propagation channel (digital transmission is interpreted to be digital data) (column 0006, lines 19-24).

One of ordinary skill in the art would have clearly recognized that wireless communication network is capable of voice, data and digital data such as Internet and

digital radio/TV broadcasting transmission. For transmitting digital data over wireless network, digital modems are used to modulate and demodulate the signals. To transmit and receive data over wireless network, it would have been obvious to one of ordinary skill in the art at the time the invention was made to design the system such that to be capable of any transmission such voice, data and digital data as taught by Joo et al. Receiving digital data via a wireless network will provide convenient way for exchanging information. Moreover, it offers to receive high-quality radio/TV broadcasting and high speed Internet access. Also, it is important to use the antenna diversity technique to ensure the quality of the transmission. Antenna diversity technique will increase the probability of receiving better signals from the source to the destination. Also it will reduce the multipath interference and improves the performance of the network.

(3) Regarding claim 7:

Tehrani et al. further discloses:

- the data communication system (column 0001, lines 1-2), wherein the RF signal path of the first antenna comprises an RF delay element (column 0005, lines 7-11); and
- wherein the RF signal path of the third antenna comprises an RF delay element (column 0005, lines 7-11).

Tehrani et al. discloses all of the subject matter as described above except for specifically teaching RF adder.

However Joo et al. in the same field of endeavor, teaches an RF adder (figure 6, 614) for every antennas in the system.

One of ordinary skill in the art would have clearly recognized that wireless communication, to reduce the multipath interference in wireless communication system, and to increase the probability of receiving better signals, diversity technique is used in wireless communication system. Diversity requires two or more antennas for receiving and transmitting RF signals. When two or more antennas are used in the system, RF (radio frequency) adders are used to add the RF output of two or more transmitters into a single output. When using multiple antennas to transmit and receive data over wireless network, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use RF adders in the design of communication system as taught by Joo et al. In doing so, the RF adder would combine the RF output of two or more antennas into one single output. Moreover, RF adder technique is useful in reducing the number of antennas on a communication tower. Also, using RF adder will reduce the amount RF cables and coax in a communication network.

(4) Regarding claim 8

Joo et al. further discloses:

- the data communication system the transmitter further comprises at least one or more of a coder (encoder is interpreted to be a coder) (column 0008, lines 1-3) and a guard interval insertion processor (figure 2, 230, 240, column 0008, lines 18-21); and
- wherein the receiver further comprises at least one or more of a decoder (column 0063, lines 1-4) responsive to codes utilized by the coder and a guard interval recognition processor (figure 2, 230, 240, column 0008, lines 18-21).

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One of ordinary skill in the art would have clearly recognized that in a data wireless communication network system an encoder (coder) and decoders are used in transmit/receive device to generate bit stream or data in a code format. Also, along with encoder, guard interval is used to ensure distinct transmissions do not interfere with one another. Furthermore, it is used to reduce propagation delays in a multipath environment. To reduce the effect of multipath interference, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the diversity technique which is the use of two transceivers and the use of encoder and guard interval as taught by Joo in designing wireless network. In doing so, the diversity technique ensures if one transceiver is in radio frequency (RF) null the other is not. Furthermore, it enhances the performance of the system in high interference areas such as multipath environment.

(5) Regarding claim 10:

Joo et al. further discloses:

- the data communication system; wherein the delays comprise IF delays (this limitation is inherent because when the signal are converted from RF signals to IF (intermediate frequency) signals, they will experience some IF delays) (column 0016, lines 5-9).

One of ordinary skill in the art would have clearly recognized that when the signals are transmitted from a transmitter due to the multipath phenomenon, it would experience delays in phase and amplitude. These delays are called RF delays. When the RF signal are received by the transceivers, they are converted into IF frequency

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signals. This will cause some IF delays in the system. To overcome these delays, antenna diversity and the use of encoders/decoder and guard interval are. To reduce the interference and delays in a multipath environment, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the diversity technique which is the use of two transceivers and the use of encoder and guard interval as taught by Joo in designing wireless network such as WLAN. In doing so, the diversity technique ensures if one transceiver is in radio frequency (RF) null the other is not. Also, it will reduce the IF delay in the system. Furthermore, it enhances the performance of the system in high interference areas such as multipath environment.

(6) Regarding claim 12:

Tehrani et al. further discloses:

- an access point (column 0024, lines 3-4) having a transceiver coupled to first and second transceiving antennae (figure 1,120, 138, 140, column 0044, lines 10-12),
- the signal path of the first antenna exhibiting a different delay than the signal path of the second antenna (this limitation is inherent because in a multipath environment, the signal takes different paths from the source to get to destination and each of these signal experiences different delays and as a result each antenna experience different delays) (column 005, lines 7-11); and
- one or more mobile terminals each having a transceiver coupled to third and fourth transceiving antennae (figure 1,110, 122, 124, column 0044, lines 10-12), the signal path of the third antenna exhibiting a different delay than the signal path of the fourth antenna antenna (this limitation is inherent because in a multipath environment,

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- the signal takes different paths from the source to get to destination and each of these signal experiences different delays and as a result each antenna experience different delays) (column 005, lines 7-11).

Tehrani et al. discloses all of the subject matter as described above except for specifically teaching a WLAN system.

However Joo et al in the same field of endeavor, teaches the wireless local area network (WLAN) system (column 0006, line 22).

One of ordinary skill in the art would have clearly recognized that wireless communication is capable of both voice and data transmission. Also, wireless technology is used for high-speed transmission in wireless local area network (WLAN). When wireless technology is used for transmission of voice, data and video, the transmitted radio frequency (RF) signal would experience RF delays due to the multipath environment. To increase the probability of receiving better signals, diversity technique is used in wireless communication system. This technique requires the use of two or more antennas (receiver and transmitter) in the one physical housing, which is called a transceiver. To reduce the effect of multipath interference, the it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the diversity technique which is the use of two transceivers as taught by Joo et al. in designing wireless network. In doing so, the diversity technique ensures if one transceiver is in radio frequency (RF) null the other is not. Furthermore, it enhances the performance of the system in high interference areas such as multipath environment. Also, using wireless network such as WLAN technology would ensure the security of the

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transmission. It will also provide high-speed transmission for voice and data communication.

(7) Regarding claim 13:

Tehrani et al. further discloses a nonzero delay of one of the signal paths of the first and second antennae is different from a nonzero delay of one of the signal path of the third and fourth antennae (this limitation is inherent because in a multipath environment, the signal takes different paths from the source to get to destination and each of these signal experiences different delays as a result each antenna experience different delays) (column 005, lines 7-11).

Tehrani et al. discloses all of the subject matter as described above except for specifically teaching a WLAN system.

However Joo et al in the same field of endeavor, teaches the wireless local area network (WLAN) system (column 0006, line 22).

One of ordinary skill in the art would have clearly recognized that wireless communication is capable of both voice and data transmission. Also, wireless technology is used for high speed transmission in wireless local area net work (WLAN) as well. When wireless technology is used for transmission of voice, data and video, the transmitted radio frequency (RF) signal would experience RF delays due to the multipath environment. To increase the probability of receiving better signals, diversity technique is used in wireless communication system. This technique requires the use of two or more antennas (receiver and transmitter) in the one physical housing which is called a transceiver. To reduce the effect of multipath interference, the it would have

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been obvious to one of ordinary skill in the art at the time the invention was made to use the diversity technique which is the use of two transceivers as taught by Joo et al. in designing wireless network. In doing so, the diversity technique ensures if one transceiver is in radio frequency (RF) null the other is not. Furthermore, it enhances the performance of the system in high interference areas such as multipath environment. Also, using wireless network such as WLAN technology would ensure the security of the transmission. It will also provide high-speed transmission for voice and data communication.

(8) Regarding claim 16:

Tehrani et al. further discloses the use of transceiver (column 0044, lines 10-12).

Tehrani et al. discloses all of the subject matter as described above except for specifically teaching a WLAN and OFDM system.

However Joo et al in the same field of endeavor, teaches the WLAN (column 0006, line 22) and OFDM system (column 0005, lines 1-2).

One of ordinary skill in the art would have clearly recognized when radio frequency (RF) signals are transmitted over a wireless channel, due to the obstacle such as walls, buildings, trees and etc, the RF signal would take different paths from the source to get to the destination. As a result, the signal experience delays in phase, amplitude and time. To reduce the multipath interference in wireless communication system, and to increase the probability of receiving better signals, diversity technique is used in wireless communication system. Diversity technique is the use of two or more antennas for receiving and transmitting RF signals. These antennas are capable of

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both transmission (receive and transmit) and are called transceiver. To reduce further the effect of multipath interference, OFDM technique is used in the transceiving device. The diversity technique in an OFDM transceiving device, will ensure the probability of receiving better signal. To reduce the effect of multipath interference, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use diversity and OFDM techniques as taught by Joo et al. to overcome multipath interference in the network. Antenna diversity and OFDM techniques will increase the probability of receiving better signals from the source to the destination. Also it will improve the performance of the network.

(9) Regarding claim 17:

Joo et al. further discloses the WLAN system (column 0006, line 22) and the OFDM system (column 0005, lines 1-2) utilizes one of binary phase shift keying (BPSK), quadrature phase shift keying (QPSK), 16-quadrature amplitude modulation (16-QAM) or 64-QAM (column 0008, lines 9-13).

One of ordinary skill in the art would have clearly recognized when using WLAN for transmitting extremely high-speed data, the OFDM modulation technique is used. This technique allows the high-speed transmission to occur over multiple frequency channels. Also, OFDM modulation further modulate the signal using other modulation techniques such as QPSK, BPSK, 16-QAM and 64-QAM. Using these modulation along with antenna diversity techniques, will reduce the effect of the multipath interference and delays the system. To increase the probability of receiving better signal, it would have been obvious to one of ordinary skill in the art at the time the

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invention was made to use the antenna diversity and OFDM, QPSK, BPSK, 16-QAM and 64-QAM modulation techniques as taught by Joo et al. to overcome multipath interference in the network. Antenna diversity and OFDM techniques will increase the probability of receiving better signals from the source to the destination. Also it will improve the performance of the network.

(10) Regarding claim 18:

Tehrani et al. further discloses the use of transceivers(column 0044, lines 10-12).

Tehrani et al. discloses all of the subject matter as described above except for specifically teaching WLAN and one or more of a coder and a guard interval insertion processor; and at least one or more of a decoder responsive to codes utilized by the coder and a guard interval recognition processor.

However, Joo et al. in the same field of endeavor teaches WLAN (column 0006, line 22) and one or more of a coder and a guard interval insertion processor (encoder is interpreted to be a coder) (column 0008, lines 1-3); and at least one or more of a decoder responsive to codes utilized by the coder (column 0063, lines 1-4) and a guard interval recognition processor (figure 2, 230, 240, column 0008, lines 18-21).

One of ordinary skill in the art would have clearly recognized that in a data wireless communication network system such as WLAN an encoder (coder) and decoders are used in transmit/receive device to generate bit stream or data in a code format. Also, along with encoder, guard interval is used to ensure distinct transmissions do not interfere with one another. It is used to reduce propagation delays in a multipath

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environment. To reduce the effect of multipath interference, the it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the diversity technique which is the use of two transceivers and the use of encoder and guard interval as taught by Joo in designing wireless network. In doing so, the diversity technique ensures if one transceiver is in radio frequency (RF) null the other is not. Furthermore, it enhances the performance of the system in high interference areas such as multipath environment.

(11) Regarding claim 19:

Tehrani et al. further discloses RF delays (column 0005, lines 7-11).

Tehrani et al. discloses all of the subject matter as described above except for specifically teaching a WLAN system.

However Joo et al in the same field of endeavor, teaches the wireless local area network (WLAN) system (column 0006, line 22).

One of ordinary skill in the art would have clearly recognized that wireless communication is capable of both voice and data transmission. Also, wireless technology is used for high speed transmission in wireless local area net work (WLAN) as well. When wireless technology is used for transmission of voice, data and video, the transmitted radio frequency (RF) signal would experience RF delays due to the multipath environment. To increase the probability of receiving better signals, diversity technique is used in wireless communication system. This technique requires the use of two or more antennas (receiver and transmitter) in the one physical housing which is called a transceiver. To reduce the effect of multipath interference, the it would have

been obvious to one of ordinary skill in the art at the time the invention was made to use the diversity technique which is the use of two transceivers as taught by Joo et al. in designing wireless network. In doing so, the diversity technique ensures if one transceiver is in radio frequency (RF) null the other is not. Furthermore, it enhances the performance of the system in a high interference areas such as multipath environment. Also, using wireless network such as WLAN technology, would ensure the security of the transmission. It will also provide high speed transmission for voice and data communication.

(12) Regarding claim 20:

Joo et al. further discloses the WLAN system (column 0006, line 22), wherein the delays comprise IF delays (this limitation is inherent because when the signal are converted from RF signals to IF (intermediate frequency) signals, they will experience some IF delays) (column 0016, lines 5-9).

One of ordinary skill in the art would have clearly recognized that when the signals are transmitted from a transmitter due to the multipath phenomenon, it would experience delays in phase and amplitude. These delays are called RF delays. When the RF signal are received by the transceivers, they are converted into IF frequency signals. This will cause some IF delays in the system. To overcome these delays, antenna diversity and the use of encoders/decoder and guard interval are. In a multipath environment, to reduce the interference and delays, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the diversity technique which is the use of two transceivers and the use of encoder and

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guard interval as taught by Joo in designing wireless network such as WLAN. In doing so, the diversity technique ensures if one transceiver is in radio frequency (RF) null the other is not. Furthermore, it enhances the performance of the system in high interference areas such as multipath environment.

(13) Regarding claim 21:

Tehrani et al. further discloses baseband delays (this limitation is inherit to be a baseband unit transceiver that has a delay) (column 0338, lines 4-8).

Tehrani et al. discloses all of the subject matter as described above except for specifically teaching a WLAN system.

However Joo et al in the same field of endeavor, teaches the wireless local area network (WLAN) system (column 0006, line 22).

One of ordinary skill in the art would have clearly recognized that wireless communication is capable of both voice and data transmission. Also, wireless technology is used for high speed transmission in wireless local area network (WLAN) as well. When wireless technology is used for transmission of voice, data and video, the transmitted radio frequency (RF) signal would experience RF delays due to the multipath environment. To increase the probability of receiving better signals, diversity technique is used in wireless communication system. This technique requires the use of two or more antennas (receiver and transmitter) in the one physical housing which is called a transceiver. These transceivers include RF and baseband units to convert data to electrical signals. This process causes delays in the system such as baseband delay. To reduce the effect of multipath interference, it would have been obvious to one

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of ordinary skill in the art at the time the invention was made to use the diversity technique which is the use of two transceivers as taught by Joo et al. in designing wireless network. In doing so, the diversity technique ensures if one transceiver is in radio frequency (RF) null the other is not. Furthermore, it enhances the performance of the system in a high interference areas such as multipath environment. Also, using wireless network such as WLAN technology, would ensure the security of the transmission. It will also provide high speed transmission for voice and data communication.

8. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tehrani et al. and Joo et al. as applied to claim 12 and 13 above, and further in view of Thompson et al. (IEE Proc.-Commun., Vol. 147, No.6, December 2000).

(14) Regarding claim 14:

Joo et al. further discloses WLAN (column 0006, line 22).

Joo et al. discloses all of the subject matter as described above except for specifically teaching the value of one of the nonzero delay is twice the value of the other nonzero delay.

However Thompson et al. in the same field of endeavor, teaches the value of one of the nonzero delay is twice the value of the other nonzero delay (column 3, lines 58-64).

One of ordinary skill in the art would have clearly recognized that when two diversity antennas are used in the system, the delay diversity method is applied to the transmitted signals. In this method the time delay of L code is applied to the signal of the second antenna to generate an artificial multipath signal for $2L$. Also, using this method will provide $2L$ diversity. To reduce the effect of multipath interference, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the diversity technique, which is the use of two transceivers in designing wireless network. Also as taught by Thompson, using the delay diversity method would reduce the multipath effect in the system. The diversity technique ensures if one transceiver is in radio frequency (RF) null the other is not. Furthermore, it enhances the performance of the system in a high interference areas such as multipath environment.

9. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tehrani et al. and Joo et al. as applied to claim 12 above, and further in view of Thompson et al and Krishnamurthy et al. (0-7803-3002-1/95 \$4.00(c)1995 IEEE).

(15) Regarding claim 15:

Joo et al. further discloses WLAN (column 0006, line 22).

Joo et al. discloses all of the subject matter as described above except for specifically teaching the multiple antennas and different delays provide an (LL) diversity exhibiting $2L$ diversity plus $10\log_{10}(L)$ dB performance.

However Thompson et al. in the same field of endeavor, teaches the multiple antennas and different delays provide an (LL) diversity exhibiting 2L diversity (column 3, lines 58-64).

Thompson et al. discloses all of the subject matter as described above except for specifically teaching diversity plus $10\log_{10}(L)$ dB performance.

However Krishnamurthy et al. in the same field of endeavor diversity plus $10\log_{10}(L)$ dB performance (column 3, lines 56-57)

One of ordinary skill in the art would have clearly recognized that when two or more diversity antennas are used in the system, the delay diversity method is applied to the transmitted signals. In this method the time delay of L code is applied to the signal of the second antenna to generate an artificial multipath signal for 2L plus $10\log_{10}(L)$ dB performance. Also, using this method will provide 2L diversity. To reduce the effect of multipath interference, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the diversity technique, which is the use of two transceivers in designing wireless network. Also as taught by Thompson and Krishnamurthy, using the delay diversity method would reduce the multipath effect in the system. The diversity technique ensures if one transceiver is in radio frequency (RF) null the other is not. Furthermore, it enhances the performance of the system in a high interference areas such as multipath environment.

Art Unit: 2609


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kabir A. Timory whose telephone number is (571) 270-1674. The examiner can normally be reached on Mon-Thu 6:30AM - 4:00PM & Fri 6:30AM - 3:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on (571) 272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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December 12, 2006


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